

AMENDMENTS TO THE CLAIMS

1-10. (Canceled)

11. (Currently amended) An isolated ~~gene~~ nucleic acid encoding an antimicrobial protein having pyranose oxidase activity,

wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2, or has ~~50%~~ 80% or more identity with said sequence and has an antimicrobial activity against Rhizoctonia solani or Pyricularia oryzae; or

wherein said protein comprises an amino acid sequence of amino acid residues 76 to 618 of SEQ ID NO:2, or a polypeptide having ~~50%~~ 80% or more identity with said amino acid sequence and having an antimicrobial activity against Rhizoctonia solani or Pyricularia oryzae, ~~or a combination of these polypeptides.~~

12. (Currently amended) The isolated ~~gene~~ nucleic acid according to Claim 11, encoding an antimicrobial protein and having a base sequence of SEQ ID NO:1, or a base sequence which is complementary to a base sequence which hybridizes to SEQ ID NO:1 under stringent conditions of 6 x SSC, ~~45°C to 68°C~~ (without formamide) ~~or 25°C to 50°C (with 50% formamide).~~

13-15. (Cancelled)

16. (Currently amended) The isolated ~~gene~~ nucleic acid according to Claim 11 encoding a protein having antimicrobial activity and having an 80% or more identity with the base sequence of SEQ ID NO:1.

17. (Currently amended) The isolated ~~gene~~ nucleic acid according to Claim 11 encoding a protein having antimicrobial activity and having a 90% or more identity with the base sequence of SEQ ID NO:1.

18. (Currently amended) The isolated ~~gene~~ nucleic acid according to Claim 11 encoding a protein having antimicrobial activity and having a 95% or more identity with the base sequence of SEQ ID NO:1.

19-21. (Cancelled)

22. (Currently Amended) A recombinant vector containing the ~~gene~~ isolated nucleic acid according to Claim 11.

23. (Original) The recombinant vector according to Claim 22 wherein said vector is an expression vector.

24. (Currently Amended) A transformed microorganism ~~transformant~~ obtained by introducing the recombinant vector according to Claim 22 into a host organism.

25-28. (Canceled)

29. (Currently Amended) An isolated gene nucleic acid encoding an antimicrobial protein having pyranose oxidase activity and having a base sequence of SEQ ID NO:1, or a base sequence which is complementary to a base sequence which hybridizes to SEQ ID NO:1 under stringent conditions of 6 x SSC, ~~45°C to 68°C~~ (without formamide) ~~or 25°C to 50°C (with 50% formamide)~~.

30. (Currently Amended) An isolated gene nucleic acid encoding an antimicrobial protein having pyranose activity, wherein said protein can be obtained from a fraction of an aqueous extract of *Lyophyllum shimeji* precipitated by the ammonium sulfate precipitation method, and wherein said protein has an antimicrobial activity at least against *Rhizoctonia solani* or *Pyricularia oryzae*, and shows the presence of components of about 70 kDa and/or about 65 kDa in molecular weight in the SDS-PAGE method.

31. (**Currently Amended**) An isolated gene nucleic acid encoding an antimicrobial protein having pyranose oxidase activity, wherein said protein can be obtained from a fraction of an aqueous extract of *Lyophyllum shimeji* precipitated by the ammonium sulfate precipitation method, and wherein said protein has an antimicrobial activity at least against *Rhizoctonia solani* or *Pyricularia oryzae*, and shows the presence of components of about 70 kDa and/or about 65 kDa in molecular weight in the SDS-PAGE method; and wherein said gene nucleic acid has a base sequence of SEQ ID NO:1 or a base sequence which is complementary to a base sequence which hybridizes to SEQ ID NO:1 under stringent conditions of 6 x SSC, ~~45°C to 68°C~~ (without formamide) ~~or 25°C to 50°C (with 50% formamide)~~.

32. (**Cancelled**)

Please add the following new claims 33-37.

33. (**New**) The isolated nucleic acid according to Claim 11 encoding an antimicrobial protein, wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2 or has 90% or more identity with the amino acid sequence of SEQ ID NO:2.

34. **(New)** The isolated nucleic acid according to Claim 11 encoding an antimicrobial protein, wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2 or has 95% or more identity with the amino acid sequence of SEQ ID NO:2.

35. **(New)** The isolated nucleic acid according to Claim 11 encoding an antimicrobial protein, wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2 or has 80% or more identity with the amino acid sequence of SEQ ID NO:2 by a substitution of one or more amino acids of SEQ ID NO:2, wherein the substitution of one or more amino acids of SEQ ID NO:2 replaces a hydrophobic amino acid with a hydrophobic amino acid, a hydrophilic amino acid with a hydrophilic amino acid, an acidic amino acid with an acidic amino acid or a basic amino acid for a basic amino acid.

36. **(New)** The isolated nucleic acid according to Claim 11 encoding an antimicrobial protein, wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2 or has 90% or more identity with the amino acid sequence of SEQ ID NO:2 by a substitution of one or more amino acids of SEQ ID NO:2, wherein the substitution of one or more amino acids of SEQ ID NO:2 replaces a hydrophobic amino acid with a hydrophobic amino acid, a hydrophilic

amino acid with a hydrophilic amino acid, an acidic amino acid with an acidic amino acid or a basic amino acid for a basic amino acid.

37. (New) The isolated nucleic acid according to Claim 11 encoding an antimicrobial protein, wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2 or has 95% or more identity with the amino acid sequence of SEQ ID NO:2 by a substitution of one or more amino acids of SEQ ID NO:2, wherein the substitution of one or more amino acids of SEQ ID NO:2 replaces a hydrophobic amino acid with a hydrophobic amino acid, a hydrophilic amino acid with a hydrophilic amino acid, an acidic amino acid with an acidic amino acid or a basic amino acid for a basic amino acid.